

## Erwin Marx Award

# IEEE Honors Tom Martin

Tom Martin, manager of Pulsed Power Systems Department 1250, was presented with the Erwin Marx Award by the IEEE at its Pulsed Power Conference in Arlington, Va. The Award, the most prestigious in the pulsed power community, is named for the originator of the Marx generator, primary energy source for pulsed power accelerators. Other recipients of the Award include J.C. "Charlie" Martin and Ian Smith of Britain's Atomic Research Establishment, both pulsed power pioneers. (Smith is now with Pulsed Sciences, Inc., San Leandro, Calif.)

Tom was cited for his "many contributions to the pulsed power community in the field of high power accelerators and the techniques for generating and transporting terawatt electrical pulses."

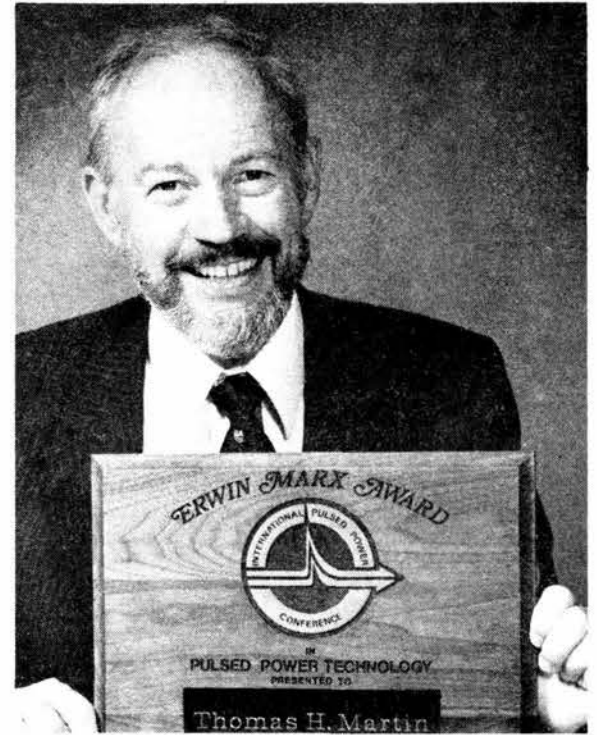
Tom originated the pulsed power program at Sandia in 1965 by heading up the team that built HERMES II, an accelerator that recently made its 25,000th shot. In the past 20 years, Tom and his group have designed and built 17 other state-of-the-art accelerators, including Hydra, Ripple, Proto II, HydraMITE, Super-MITE, PBFA I, and PBFA II.

Now under construction in Area IV, PBFA II is expected to go on line in January 1986. It will produce up to 100 trillion watts of power, accelerating light ions onto a fuel pellet as part of efforts to produce energy by inertial confinement fusion. The machine is believed to have a good chance of being the first to ignite a fuel pellet, a key step in ultimately generating electric power by fusing atoms of heavy hydrogen (deuterium and tritium).

In accepting the Marx Award, Tom noted that any development of a major accelerator is a team effort and he mentioned several Sandians who have worked on the Labs' pulsed power program from its beginning — Ken Prestwich (1240), Ray Clark (1245) and Dave Johnson (1245). He also recognized management support — "They've always wanted one more accelerator constructed."

At the conference, Tom presented a plenary lecture on the "Good News — The Future of Pulsed Power." Pulsed power can provide intense particle beams or electromagnetic pulses that can drive a great variety of experiments. In fact, he foresaw giant accelerators such as PBFA II as "triggers" for even larger bursts of electrical or nuclear power.

Tom joined Sandia in 1956 after earning a BS degree in EE from Purdue. He earned a MS in EE from Purdue in 1958 while in the Air Force and on leave from the Labs. After returning to Sandia, he earned a MS in ME from UNM in 1965. He is the author or co-author of 35 technical publications in the open literature and has delivered more than



TOM MARTIN (1250) displays the Erwin Marx Award he received recently at the 5th Annual IEEE Pulsed Power Conference in Arlington, Va., in recognition of his achievements in pulsed power accelerators.

70 invited lectures to universities, national laboratories, and industry. In 1983, the DOE recognized Tom in its Awards of Excellence program for contributions to the nuclear weapons program.



## For Refractory Metals

# New Chemical Machining Method Developed

Molybdenum and other refractory metals are notoriously difficult to machine because they're extremely hard and highly resistant to heat. But a new electro-chemical milling process developed at Sandia is producing excellent results in such metals.

The new process, called Electropulse Chemical Machining (EPCM), uses pulses of current rather than the continuous current typical in standard electrochemical machining and processing.

Etch rates with the new process are much faster than with existing methods — one minute vs. 10 minutes for a typical task. In addition, a corresponding improvement in surface finish is achieved. Much higher current may be used with the pulsed equipment (up to 4300 amperes per square foot) — which produces an etch rate on a single-side workpiece of 240 micro-inches (millionths of an inch) per minute; the rate compares with 12 micro-inches per minute with standard equipment.

Reproduction of lines and features to 2 mils (two thousandths of an inch) can be achieved repeatedly, with superior contour definition and edge configuration; again, a

*(Continued on Page Two)*



ELECTROPULSE CHEMICAL MACHINING is demonstrated by developers Steve Rospopo (7471) and T.A. Allen (7484). T.A. attaches electrodes to a molybdenum part in the electrolyte tank. A direct current power supply (middle) is connected through a pulse generator (in front of Steve) to the reaction cell. Above, the workpiece, a test pattern, is displayed by Steve.

# Antojitos

A Score Already Calendars don't exactly lie, but they present a reality that is often most difficult to accept. I just observed the 20th anniversary of my hiring in at Sandia. And I still feel like a new hire -- so much technology I thought I'd surely understand by now, so little mastered.

But it's been a fascinating 20 years. I've arrived at work by car pool, van pool, bus, bicycle, motorcycle, foot, hitchhiking, and, yes, in my old truck. Because I've been blessed with the chance to work in seven different Sandia organizations over the years, I've had a wide variety of work assignments. Even more satisfying is that I've had seven different foster families of co-workers with whom I've celebrated births, marriages, transfers, promotions, and retirements; and with whom I've sympathized during illness, accident, and death. (And divorces -- they can fall into either category.)

Although the old cliché that "Life is what happens to you while you're making other plans" is true, and although it's also true that I never expected 20 years ago to still be here in 1985, it's been, on balance, a good score of years. Thanks, Sandians.

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Fired, Laid Off, Terminated, Etc. I note two new (to me at least) euphemisms for the state of not having a job anymore. One is "dis-hire." The other is "to be made redundant." It's apparently British, but I first noticed it in the Tonopah newspaper's story on the folding of the Silver Strike casino, which left 20 employees "redundant." Then there's the bureaucratic "RIF," for Reduction In Force. Past tense ought to be rified (or RIFFed?), I think, but I keep hearing rifted (analogous to drowned rather than drownded, I assume). No, I haven't heard any rumors of Sandia firings, lay-offs (or lay-ons, for that matter), terminations, dis-hirings, or redundancies.

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Aquellos son ricos, que tienen amigos. (Wealthy is the man who has true friends.)

Continued from Page One

## EPCM Method

significant improvement over conventional methods.

For molybdenum, the EPCM equipment pulses once each second; each pulse lasts one-tenth of a second. During the nine-tenths of a second that the equipment "rests," the etch solution dissolves the waste coating (called "smut"), which most electro-milling techniques produce, and leaves a bright, clean surface on the work-piece.

Developed by T.A. Allen and Steve Rospopo of Sandia's Process Development Laboratories, EPCM is an adaptation of pulse electroplating equipment that has been available in the electroplating industry for the past two years.

"The Shops had an assignment to produce some sputtering masks out of molybdenum," T.A. recalls. "It was slow, difficult work. Molybdenum (like all refractory metals such as tungsten and tantalum) must be worked at high temperatures, near 5000°F. With conventional etching equipment we are getting dendrites, or whiskers, along the straight edges of the mask. The time required to produce a good part was lengthy; costs were out of hand. At this point, I decided there had to be a better way.

"I was familiar with the new pulse electroplating equipment used for applying thin metal coatings to substrates, and it occurred to me that it might be possible to reverse the process and remove material with the equipment. Steve adapted the equipment and made it work."

The apparatus consists of a variable direct current power supply connected through a pulse generator to the reaction cell, which has an electrolyte chamber and a cathode. Temperature and stirring rates are adjustable from a central minicomputer control console.

Parts to be machined are coated with a 150-micro-inch thickness of photoresist polymer. After exposing a pattern of the component shape onto the photoresist and developing it, the part is ready for etching.

The reaction cell contains a combination etchant/electrolyte of potassium ferricyanide and sodium hydroxide.

Other advantages of EPCM are that resists and masks last longer, formation of harmful reaction products is reduced, average current requirements are lower, and cheaper and weaker (therefore safer) etchants are suitable for the new process.

"Industry has shown considerable interest in the new process," T.A. says. "It promises to cut costs of electro-chemical milling of refractory metals by more than half."

### Commuter Notes

Several Sandians are interested in forming a vanpool from the Rio Rancho area to Sandia and DOE. If you are interested, please call June Aydelotte on 4-RIDE by July 12.

## Sympathy

To Bill Zagar (2857) on the death of his mother in Oklahoma, June 10.

To Laura Latorca (21-1) on the death of her brother-in-law, June 19.

To Patsy Brito (21-1) on the death of her grandmother, June 18.

To Merlene Candelaria (7864/7865) on the death of her mother, June 24.



JOE LAVAL (3163) explains the use of a photovoltaic collector to Highland High School students participating in the Sandia Summer Science program. Now in its twelfth year, the program has served over 500 high school sophomores in APS and Bernalillo high schools. Classes are held for three hours every morning in a high school that is already offering a regular summer school program. Students can earn 1/2 credit of lab science. Sandia provides instructors from the technical staff, and the school provides classrooms, audio-visual equipment, and lab equipment. Sandia also hires a certified science teacher consultant from the school system to assist the instructors in each class. This year, 32 Sandians participated in the program.

## LAB NEWS

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# Finding Out What We Need to Know

Reactions were strong — and positive. “We should have had this a long time ago,” and “This was a great way to find out what we need to know.” “This” was Sandia Livermore’s first Professional Secretarial Seminar held recently at Sunol Valley Country Club.

Purpose of the sessions, divided into two days of identical programs so that half of Sandia’s secretaries could attend each day, was to provide an open line of communication between secretaries and management, and to encourage continued self-development.

After vice-president Dick Claassen (8000) introduced each day’s program, Facilities Planning Division supervisor Bob Johnsen (8254) discussed construction projects underway, future site plans, and the most immediate issue of all — approximate dates that people can expect to move back into Bldg. 912.

He also explained that the rush to complete the west parking lot caused some sticky and rough surfaces there. But he noted that Sandia plans to take more time to ensure this won’t happen with the parking lot reconstruction now underway closer to Bldg. 911, and eventually the contractor will return and resurface the far west lot as well.


Next, Art Krakowsky, who works at LLNL and also does personal and family counseling and teaches at industrial seminars, discussed stress management — the effects of stress on people and their jobs. He pointed out several signs of strain that people can learn to detect in themselves. He also noted that rehashing a stress-causing incident recreates the symptoms in the body all over again — the tension, the jolt of adrenaline — and the body is not designed to withstand frequent stress. Many people need to learn how to relax and avoid rehashing an incident.

Sandia medical chief Dr. John Rhodenbaugh followed with advice on nutrition and fitness. He explained that the terms fitness and nutrition are complementary — with good nutrition you are more fit physically. He also emphasized that people need to change what is known as the typical “American good life” (translation: high-fat) diet to a high-fiber diet that includes complex carbohydrates.

A speaker from the FBI pointed out methods of combatting espionage and terrorism. He explained how foreign agents will befriend an employee who has access to national secrets and, over a period of time, coerce that person into divulging information that can be used by foreign governments.

John Tompkins, director of a commercial consulting group called Team Edserve, discussed effective communications. He included a team-building technique known as the Myers/Briggs Type indicator which is a non-judgmental method of recognizing, and coping with, differences among people and their behavior patterns.

Both days concluded with a panel discussion of questions secretaries submitted earlier. Here are some typical questions



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NEARLY ALL Sandia secretaries attended the first Professional Secretarial Seminar at Sunol Valley Country Club.

and answers: Q. Are Sandia secretarial salaries competitive with the surrounding area? A. Yes, Sandia conducts annual surveys that indicate that salaries are indeed competitive. Q. How do secretaries get information about their pay level and performance evaluation? A. From their immediate supervisors. If they’re not satisfied, they can contact their personnel representatives.

Q. What plans are there for additional secretarial training for both new hires and longer-term employees? A. Sandia is working on a plan for new secretaries to ensure that they’re properly trained. And there are some courses available now for on-roll secretaries; other courses will be added if there’s a demand. Q. Why doesn’t Sandia allow job sharing? A. The secretarial area isn’t the kind of job conducive to sharing — continuity is too important for job-sharing to work. Q. Are there any plans for providing day care at Sandia? A. There are no such plans; however, Sandia is keeping in contact with LLNL regarding its plans for a day care center at the Almond Avenue School; if such a center ever comes about and if there’s room, then Sandians would have access to a day care center.

Panel members were Arnold Schuknecht (8020), Carol Verity (8026), Tonni Nunley (8022), and Deborah Linnell (8471). In addition to Deborah, other members of the Secretarial Committee that organized this first seminar were Terry Higuera (8151), Kelly McCuen (8274), and Barbara Combs (8361).

## Retiring



RAMONA ANDERSEN (8024)

## Congratulations

Anna Wilson and Bob Cattolica (8351), married May 27 in Edinburgh, Scotland.

Joanie and Tim Eklund (8173), a daughter, Shellie Marie, May 4.

Gayla and Bob Chan (8176), a daughter, Jessica Karlene, June 13.

### SWOP



“I wish to become a member of SWOP (Speakers Who Oppose Publication). The problem is not just that books of conference proceedings tend to be boring, out of date, and rarely contain material that has not been published elsewhere in a better form, but that the books are impairing the spoken communications at conferences. Some speakers when asked to provide their paper for subsequent publication use that paper as a script for their talk. Even speakers who are usually good at presenting their work become dull when reading from a prepared script; one can understand them so doing, because the burden of preparing one script for the spoken presentation and a different one for the written is heavy. I prefer the spontaneity, the passion, and the occasional indiscretion of an unscripted spoken communication.”

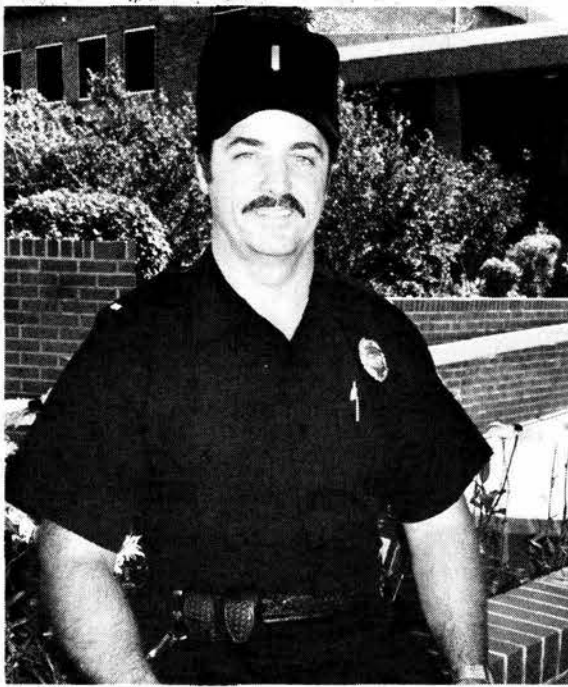
Roy Meadow in *British Medical Journal*

### DWH?

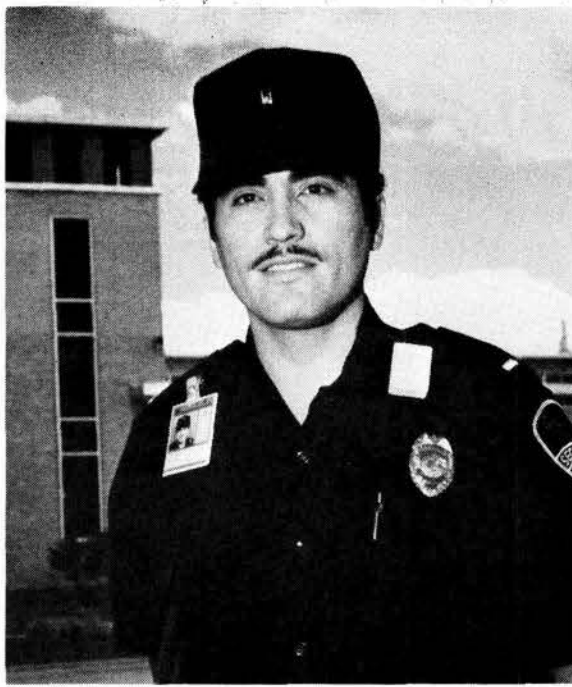


“Although the detrimental effects of being drunk while driving are well known, a recent report from Sweden’s Natl. Road & Traffic Research Inst. indicates that a hangover — that dizzy, queasy, next-morning feeling — may also diminish driving ability by as much as 20% even when the blood alcohol concentration (BAC) is 0 mg/dL. Furthermore, according to the report, a person’s ability to carry out complex driving maneuvers is reduced for at least three hours after the BAC reaches zero, and hangover-impaired subjects demonstrate a marked inability to subjectively determine if they are fit to drive at all. The study, carried out in Sweden by Hans Laurell and Jan Tornros of Statens vagoch trafikinstitut (VTI), was published [in 1982]. Since publication, Swedish road officials have launched a public information campaign to tell people about the possible hazards of driving with a hangover.”

Daniel Franck in *Journal of the American Medical Association*



JIM DUFFY (3436)



PAUL BACA (3436)



Here are some current volunteer opportunities for employees, retirees, and family members. If you would like more information, call Karen Shane (4-3268).

**RETIRED SENIOR VOLUNTEER PROGRAM (RSVP)** needs a photographer to take a few shots at Albuquerque senior centers. Photos will be enlarged and used at an RSVP booth at the Civic Plaza on Summerfest's Americana night, July 27.

**CRIME STOPPERS** is a program that originated in Albuquerque to encourage anonymous callers to supply information that leads to the arrest and indictment of criminals. Crime Stoppers International is looking for both a bookkeeper and a data processor to assist in its office on Mountain Road several hours a week.

**CATHOLIC SOCIAL SERVICES OF ALBUQUERQUE**, a non-denominational United Way agency, needs an editor (to write, lay out, and paste up) for its monthly newsletter for seniors.

## Supervisory Appointments

JIM DUFFY to Lieutenant in Security Operations II, North Force Division 3436, effective June 1.

Jim became a fulltime security inspector for Sandia in October 1982. Before joining Sandia, he had worked for nine years with the Tactical Patrol Force of the New York City Police Department.

Jim earned an associate degree in criminology from the NY Institute of Technology. He served in the U.S. Army from 1965-68, with one year in Vietnam. His principal hobby is weight lifting. He and his wife Theresa have three children and live in Rio Rancho.

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PAUL BACA to Lieutenant in Security Operations II, North Force Division 3436, effective June 1.

Paul became a fulltime security inspector at the Labs in March 1982. He served in the U.S. Marine Corps from 1974 to 1978, and was stationed in Japan for two years. Paul participated in the evacuation of Vietnam in April 1975. While in the service, he attended Chapman College, studying criminology. Before joining the Labs, he attended T-VI and received a certificate in the electrical trades.

Paul enjoys hunting, fishing, and camping. He and his wife Nancy have three children. They live in NE Albuquerque.

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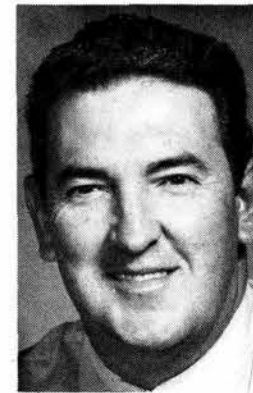


LONNIE FOSTER (3436)

LONNIE FOSTER to Lieutenant in Security Operations II, North Force Division 3436, effective June 1.

Lonnie became a fulltime security inspector in October 1983. He has a BA from UNM with the emphasis on criminology. He served in the U.S. Air Force from 1970-78, with one year in Vietnam. Lonnie enjoys playing slow pitch softball, fishing, and coaching Little League baseball. He and his wife Martha have six children and live in the SE heights.

## Deaths



Tony Garcia of Shipping and Receiving Division 3428 died June 26 after a lengthy series of illnesses. He was 60.

He had worked at the Labs since May 1948.

Survivors include his wife, a daughter, and a son.

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Samuel Sena of Property Management and Accountability Division 3422 died June 26 after a long illness. He was 45.

He had worked at the Labs since October 1966.

Survivors include two sons, two daughters, and his brother Bill (3426).

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Mick Cockrill of Tonopah Test Range's Test Measurements Division 7171 died June 23 after a long illness. He was 56.

He had worked at the Labs since May 1956.

Survivors include his wife, two daughters, and a son.

## Welcome

### Albuquerque

Denise Coleman (5261)  
Sabina Erteza (2314)  
Steven Humphreys (2335)  
Kim Rawlinson (7253)  
Robert Ripple (1272)

### Arizona

Duane Bowman (7263)

### California

Michael Beeler (7841)  
Robert Brocato (325)

### Colorado

Kent Pfeifer (1142)

### Indiana

Deborah Brunty (2531)  
Amalia Lopez (1636)

### Kansas

Douglas Doerfler (5238)

### New Jersey

Byron Han (5238)

### New Mexico

Robert Galloway (7842)

### Ohio

Barbara Mills (2311)  
Richard Ormesher (321)

### Oklahoma

Ronald Morris (1834)  
Fred Opper (2542)

### Oregon

Randy Normann (5145)

### Pennsylvania

Atlas Ford (7843)

### Texas

Robert Chambers (1523)  
James Mangum (5164)

## Spare Time Tinkering Saves Time, Saves Money

Few of us have designed and implemented any system that reduces time by 80 percent and costs by 88 percent compared to earlier designs. But James Schulze of Experimental Systems Design Division 6452 has. And what's more, he did it on the side, when he wasn't working at his principal job.

Sandia employs Jim to do electro-mechanical design in support of research reactor operations and experiments. But his "unofficial" work — designing, building, and installing a unique, computer-based personnel accountability system — has earned him special recognition.

Jim developed an accurate, time-saving and cost-efficient means of keeping track of everyone who comes and goes from Tech Area V — knowing who's where when.

"The real problem was during evacuation drills, which we have every other month or so," says Jim. "Some 200 people would pack into the evacuation building on the perimeter and sign in and out. Emergency team members checked badges and cross-checked by manually flipping switches on a light board. It took 30 minutes. That's a long time for a drill, too long for anything but a drill. In a real emergency someone could be injured before we ever knew that anyone was missing."

Jim's new accountability system uses a commercial personal computer (PC) that Jim upgraded with additional memory and a hard disk peripheral drive for increased data storage. He designed the entire system and installed most of it — from matching components to writing the program to stringing wires from building to building.

"The program reads the bar code from the back of an employee's badge, records who's coming in and out, and relays the data to a light board," says Jim. "In an evacuation drill, employees gather in the evacuation building and present their badges to be read through bar code readers. Any badges not run light up in red on the board. In six minutes, we know who's missing."

Other computer-controlled accountability systems had been tried over the last 10 years, but none were sufficiently reliable. One system considered used a larger, more expensive mini-computer with as much as 30 percent downtime. Jim's PC system has had less than 1 percent downtime.

"That PC sits out in the guard shack. Coffee and soft drinks splatter the keyboard, and cigarette smoke circulates through the chassis vents. There's so much dust we have to blow it out every couple of months," says Jim. "But the system hasn't missed a beat. The very few problems we've had have come from operators who occasionally misinterpret screen-displayed instructions for different procedures."

The system cost \$6000 — that's compared with several times that amount spent trying out other computer-controlled personnel accountability systems.

"It's a bargain," says Jim. "Other labs are interested in it, too. Livermore is evaluating a version now, and Hanford wants to see one. We use two similar set-ups inside Tech Area V to monitor entry and exit at the



HIGH TECH TINKERER AND HIS TOOLS — Jim Schulze (6452) smiles above the tools of his spare time toil — an off-the-shelf personal computer (PC), a standard bar code reader (on top of the PC, left), and three proximity readers (left behind bar code reader, right, and foreground right next to keyboard). Using these machines, Schulze designed, built, programmed, and installed the personnel accountability system used in Tech Area V.

test reactor areas."

Jim is finishing an improved version that will save still more time by eliminating the need to hand-run badges through the bar code readers.

"By embedding a microchip in each badge, we can just wave our badges at a 'proximity reader' as we file into the evacuation room," Jim explains. "It's all programmed and ready to go and will cut the roll call verification time from six minutes to two. That's better cost-efficiency, but more important is the time saved getting to a missing person, who might be injured or endangered during a real emergency. Four minutes can make a difference."

PC's lie scattered about in parts on the shop benches that ring Jim's desk. His computer-controlled personnel accountability system saves time and saves money now. Someday it may save someone from serious injury, or even save a life. Not bad for spare time tinkering.



BADGE BAR CODE DISPLAYED — A light-pen reads the bar code on the back of an employee's badge. The computer displays and records the employee's social security number, name, initials, and clearance status, giving security inspectors a quick and accurate census of employees and visitors in a controlled area.

### Nuclear Journalism



"Average annual fatalities expected from nuclear power, according to most scientific estimates, are fewer than ten. Even the largest anti-nuclear activist organization, the Union of Concerned Scientists (UCS), which serves as scientific adviser to Ralph Nader and runs newspaper ads calling for a moratorium on nuclear power, anticipates only about 130 fatalities per year (based on their high estimates for the frequency and severity of reactor meltdown accidents). In view of these fatality estimates, it seems fair to say that nuclear power does not merit its number-one risk rating; clearly, even the well-educated and intellectual segments of the American public have been badly misinformed. As a result of that vast gulf of misinformation, utilities are cancelling nuclear power plants and building coal-fired plants instead. Every time this is done, many hundreds of citizens are condemned to death — all studies, including that by the UCS, agree on this — so the price of public misinformation is many thousands of deaths per year."

Bernard Cohen (U. Pittsburgh)  
in *Policy Review*

## Sandians EXPLORE For the Albuquerque Museum

It was 11 months in the making and hours of work every night and weekend for three weeks before it opened. But for 35 Sandians, exhaustion quickly became elation as they felt the delight of hundreds of kids and their parents who pushed, pulled, peered, peeked, and poked through EXPLORE — a roomful of science in action that opened June 1 at the Albuquerque Museum.

"It's a physics playground," says Dave Ginley (1154), who coordinated the construction phase of the project. "EXPLORE presents fundamental scientific principles by asking museum goers to participate in phenomena that demonstrate those principles. That's real science — experiencing wonder, and then the moment of intellectual recognition. 'Hey!' the kids say, 'I did it! I understand!'"

EXPLORE came together as it did because of a happy coincidence of needs. For several years, the New Mexico Academy of Science has sought funding for a state science center that would include a museum with EXPLORE-like exhibits.

"The center would be an educational and cultural institution," says Jim Schirber (1150). "In addition to the museum, a science center would conduct educational outreach programs for science students and their teachers. It would also serve as a conference center for professional science and engineering societies. We proposed a feasibility study to this year's State Legislature, but it wasn't funded."

The Albuquerque Museum had dismantled its earlier EXPLORE exhibit of kinetic sculptures to allow the exhibition room to be used as the staging area for a traveling show. Once the show was on the road, the museum wanted to re-open EXPLORE, and was looking around for a new exhibit — at about the same time that the Academy realized its feasibility study wouldn't be funded.

A committee from the Academy of Science, which included Sandians Jim Schirber and Marvin Moss (1824), proposed to the museum's board of Trustees a new EXPLORE of science exhibits — a pilot project demonstrating the potential for public interest in a science center. The Albuquerque Museum was pleased to accept the Academy's offer.

"Our old EXPLORE taught sensory awareness and aesthetic involvement," says Mary Beth Acuff, Public Information Officer for the Albuquerque Museum. "The kinetic sculptures were meant to be touched, but they were works of art, too. Kids loved them, but they physically abused them. Also, many parents abused the idea of EXPLORE — using the exhibit as an unsupervised nursery."

"The new EXPLORE exhibits are sturdier than the sculptures were, and parents are as fascinated by the science as their kids are. Families get involved in the new EXPLORE, and we like that."

Once the museum agreed to give the EXPLORE room to the scientists, they looked through "cookbooks" describing successful exhibits at other science museums, such as the Exploratorium in San Francisco and the Franklin Institute in Philadelphia. Unfor-



LOOK AGAIN! Sandians (from left) Marvin Moss, Jim Schirber, and Dave Haaland stand inside the distorted room in the EXPLORE exhibit at the Albuquerque Museum. The room appears ordinary enough, but its extraordinary effect on Marvin, Jim and Dave argues some powerful magic at work! The artist's drawing (Page Seven) explains the reality behind the illusion.

tunately, many of the recipes for concocting exhibits were not very specific or detailed.

"The plans for the distorted room [see drawing] weren't really plans at all," explains Dave. "They describe the room and say 'Experiment as you go.' My wife drew up plans for specific dimensions for the room. The Franklin Institute people are calling us now, asking for the plans."

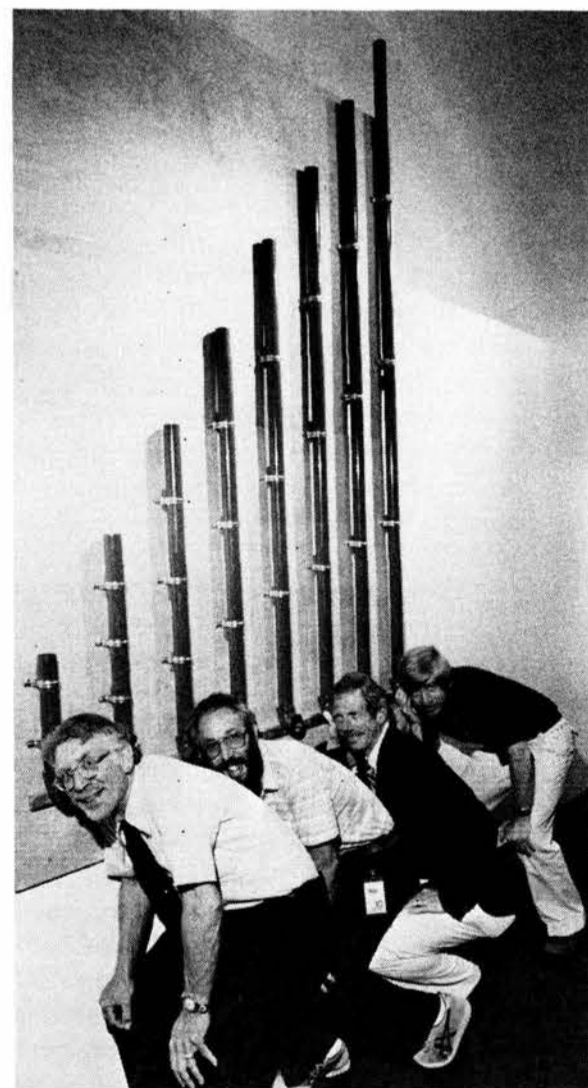
Once the exhibits were chosen, the next step was organizing volunteers to donate materials and build the exhibits.

"EXPLORE was not a Sandia project," says Marvin. "Sandians orchestrated the volunteer efforts of a state-wide community. More than 20 different groups contributed materials. Twice that number, 35 from Sandia alone, volunteered their time and labor. We never had to force people. Once they saw the project, they got caught up in the enthusiasm of making it happen."

The distorted room was built over three weekends by apprentices in the Carpenter's Education Program of the New Mexico office of the Association of General Contractors. The steel frame for the harmonograph (see photo) was fabricated at New Mexico Tech in Socorro and shipped to the museum.

"It arrived in pieces at six o'clock the night before the opening," remembers Dave. "The pieces were numbered but there weren't any instructions for assembly. Our harmonograph evolved into completion as we worked on it for hours after midnight and still more hours the next morning. When the exhibit opened, it worked — but the paint on it was still tacky."

Other problems weren't as dramatic or urgent, but they required the same adaptive ingenuity to solve them.



THE SOUNDS OF SCIENCE — Listening are (from left) Marvin Moss (1824), Dave Ginley (1154), Jim Schirber (1150), and Dave Haaland (1823), four of the 35 Sandians who volunteered to help create the EXPLORE show of science exhibits that opened last month at the Albuquerque Museum. The different lengths of pipe are selectively resonating with different frequencies — and therefore different pitches — of the sounds produced by the excited children (and parents) visiting the EXPLORE exhibit.

**Q.** Why does Sandia allow smoking in offices and threaten the health of non-smokers? There is solid evidence linking lung disease in non-smokers to exposure to cigarette smoke. I work in an office of 27 employees; four employees smoke, which is a definite threat to the health of the other 23. It appears that only smokers have rights. I feel Sandia should provide smoking areas and eliminate exposure to cigarette smoke in the office.

**A.** Sandia doesn't have a policy that covers all individuals, in all offices, all of the time, regarding not smoking. As far as I am concerned, it is almost impossible to define and measure the alleged hazard of passive smoking.

There is no question in my mind, however, that there are offices where smoke presents a definite irritation to employees. These situations should be reported to supervision and acted upon individually. It has been my experience that mature employees can usually solve these problems within their own organization with a little cooperation from everyone. The Industrial Hygiene Division has performed a number of studies in Sandia office areas and has never measured any levels of carbon monoxide or of known carcinogens that even approach a level that might be considered a health hazard.

However, if your problem cannot be resolved internally, then the line supervisor may request assistance from Industrial Hygiene Division 3311. The division will investigate the work area and provide additional assistance.

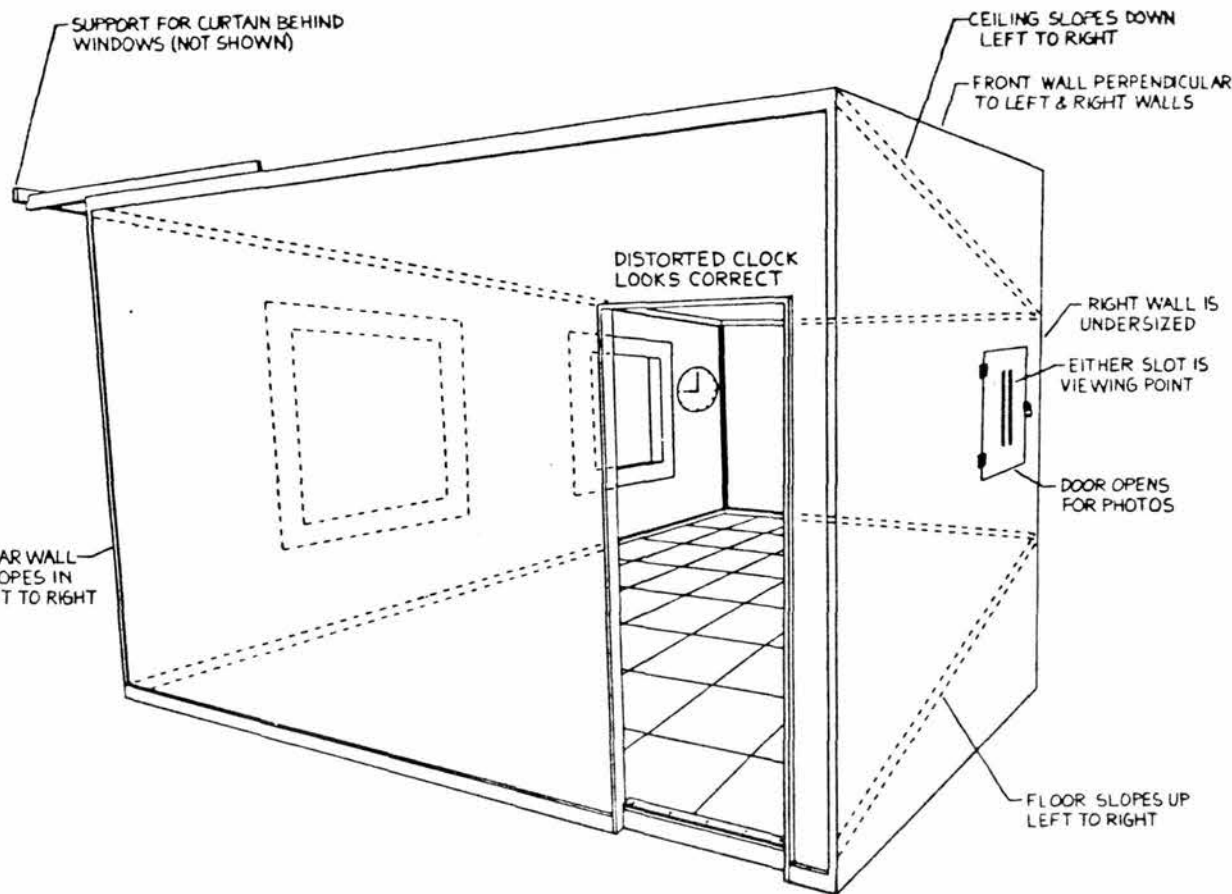
P.B. Mossman, M.D. - 3300

**Q.** We need more than one career counseling course. The "Career Counseling Workshop" is offered only out-of-hours and enrollment is limited to 20 students.

**A.** Your point that the "Career Counseling Workshop" serves only a limited number of employees each semester is well made. Unfortunately, as with many other educational programs, limited classroom space and availability of staff to conduct courses preclude multiple offerings at this time. But we do offer an in-hours workshop, "Managing Professional Growth," which Training Division 3523 has run for the past several years. Briefly, the workshop provides a structure for identification of personal talents and development needs and focuses on setting goals for career development. Announcements of the workshop are made through the *Weekly Bulletin*.

Other career counseling resources are available on an individual-initiative basis. Employees are encouraged to discuss their career goals with their immediate supervisors and/or their personnel representatives. Employees are also encouraged to call the Training Hotline (6-1482) for information on Sandia's education programs that relate to their specific career goals.

J.R. Garcia-3500



DISTORTED ROOM'S SECRET is revealed in this drawing from the "cookbook recipe" used by Sandians to design the room for EXPLORE. All points of reference in the room have exactly correct angular positions for the eye to mistakenly see a rectangular space when it looks from one vantage point — the window in the right wall, through which the camera took the picture on Page Six. Each point in the room lies along the line of sight leading from the vantage point (the window) to the position the point would occupy in a rectangular room. From any other vantage point, the room's far-from-square trapezoidal shape — caused by the slopes of the floor, ceiling, and wall in the foreground — is readily apparent.

One exhibit demonstrates how sound waves resonate. Different lengths of pipe (see photo) allow different frequencies of sound to resonate within them. Longer pipes selectively reinforce lower pitched sounds — with longer frequency waves — and shorter pipes reinforce higher pitched sounds — with shorter frequency waves. That's why the shorter piccolo produces a higher pitched sound than the longer flute.

The recipe says that different lengths of pipe attached to the wall in the exhibition room should resonate with sound at the different pitches — determined by the pipes' lengths — that they select from the gamut of sound frequencies in the room. But when the exhibit was first set up, it didn't work.

"The recipe didn't specify a particular material for the pipes," says Dave Haaland (1823) who worked on several of the exhibits. "We had some PVC pipe, so we used that first. But those plastic pipes were like black holes for sound — nothing resonated in them. So we got some metal plumbing pipes. They worked. And the exhibit excites the kids — 'Mommy! Put your ear on this!'"

Nearly every exhibit needed some fine tuning before the opening to make it do what it was supposed to do. But that was much of the fun for the Sandians who worked on the project.

"It was a trial and error barn-raising," says Dave Ginley. "EXPLORE came alive for us as we made each part of it work. Now we want a living exhibit, an evolving exhibit. We'll keep working on what we've got and probably add some new pieces, too — perhaps have a contest for visitors to suggest an exhibit."

EXPLORE will be at the museum through the summer of 1986. After it leaves the Albuquerque Museum, everyone involved hopes the exhibits will eventually

move to a larger, permanent home in the exhibition hall of a state science center.

"The museum is officially the Albuquerque Museum of Art, History, and Science," explains Mary Beth. "But we've had little room for science. We'd love to see EXPLORE open the doors to a new science museum at a state science center, just as our exhibit of New Mexico fossils helped focus the interest that led to building the new Natural History Museum."

Marvin, Dave, Jim, Dave Haaland and all of the other Sandians who worked on EXPLORE would like nothing better. But a state science center remains an idea, years away from construction. For now, they can find more than a little satisfaction in one room at the Albuquerque Museum, where children and their parents are discovering the absorbing fascination of science through the exhibits of EXPLORE.

#### Quick Scientists



... "Why do scientists peak sooner than most other professionals? No one knows for sure. I suspect it has something to do with the single focus and detachment of the subject. A handiness for visualizing in six dimensions or for abstracting the motion of a pendulum favors a nimble mind but apparently has little to do with anything else. In contrast, the arts and humanities require experience with life, experience that accumulates and deepens with age. In science, you're ultimately trying to connect with the clean logic of mathematics and the physical world; in the humanities, with people. Even within science itself, a telling trend is evident. Progressing from the more pure and self-contained of sciences to the less tidy, the seminal contributions spring forth later and later in life. The average age of election to England's Royal Society is lowest in mathematics. In physics, the average age at which Nobel prize winners do their prize-winning work is 36; in chemistry it is 39, and so on. Another factor is the enormous pressure to take on administrative and advisory tasks, descending on you in your mid-30's and leaving time for little else. Such pressures also occur in other professions, of course, but it seems to me they arrive sooner in a discipline where talent flowers in relative youth."

Alan P. Lightman in *New York Times Magazine*

## Fun & Games

**Swimming** — The Olympic swimming pool on KAFB East closed July 1. The pool will undergo a complete renovation and reopen in about six months, according to Base recreation officials.

\* \* \*

**Tennis** — The Sandia Tennis Association is holding a tournament July 13-14 at the Coronado Club courts. Three events are scheduled — men, women, and mixed doubles. Gift certificates and T-shirts go to winners. To enter, contact tournament director Jim Martin (2312), 4-7441, or Tim Mooney (5144), 4-3218.

STA is also sponsoring tennis instruction for beginners and intermediates starting July 15 at the Club courts. Eight weeks of instruction are planned. Classes will meet at 5:30 or 6:30 Mondays and Wednesdays or Tuesdays and Thursdays. To enroll, call Stan Ford, recreation manager, 4-8486.



**AT LAST, FIRST!** After finishing second so many times, she had begun to feel like a "professional runner-up," says Linda Branstetter (1524). But this year she won the Albuquerque Women's City Championship golf tournament. With the match tied, Linda sank a 15-foot putt on the last hole to win over Rosemary Thompson, 1-up. Linda began playing golf when she was 11 and was the Indiana Amateur Champion in 1979. Because of lack of time, she plays in only one or two tournaments a year. This victory was particularly sweet because she came in second to Rosemary last year.

### Protecting Computers from the Opportunists



... "Computer-security specialists must formulate a comprehensive program based on expert technological knowledge. Otherwise, opportunistic people will seek the chance to do wrong. Violators range from those who see a potential to steal large amounts of money with relatively low risk of apprehension to those who would like to obtain protected information without proper authorization. 'Petty theft' is a new problem — employees misusing computer resources by playing personal games or doing personal business activities on a company computer."

Arlin Cooper (Sandia Natl. Laboratories, NM)  
in *Computer-Security Technology*

## Take Note

Allison Davis (1813) and her husband are playing the lead roles in the Albuquerque Civic Light Opera Association production of "They're Playing Our Song." Allison described the musical as basically a two-character show with an eight-member chorus. The show opens at Popejoy Hall on July 19 and runs through Aug. 3. Curtain time is 8:15 p.m. on Fridays and Saturdays and 2:15 p.m. on Sundays. Tickets are available at KAFB's Que Pasa Recreation Center, 4-5420.

\* \* \*

The NM Solar Energy Institute will present a "Solar Adobe and Earth Construction" workshop Aug. 24, in Lecture Hall S-10 on the T-VI main campus. Included in the agenda are "Earth Systems Building: Design and Construction Detailing"; "Remodeling with Adobe: Problems/Solutions"; "Making Sun-Dried Adobe Blocks"; "Insulating the Solar Adobe"; and "Rammed Earth: Design and Construction."

The fee for this workshop, designed for builders, owner/builders, architects, and others interested, is \$20. For information about registration, call 1-800-432-6782.

\* \* \*

Achtung! Sprechen Sie ein wenig Deutsch? Möchten Sie besser sprechen? Kommen Sie am 16. Juli, um 12 Uhr, zum Coronado Klub. Wir treffen uns auf der Patio.

For more information about this meeting of an out-of-hours German class, call Judy Moore (1641), 4-5621.

\* \* \*

The South 14 Bookstand — *The Best from New Mexico Kitchens*, by Sheila Cameron, contains recipes best described as eclectic: teriyaki marinade, pojarski, veal Oscar, Navajo blood sausage, quiche Lorraine Farigoule, stuffed grape leaves (dolmades), fettine di manzo alla pizzaiola, and, of course, 101 dishes based upon the noble chile. If you're a purist, there are even a few pages devoted to building your own horno — that neat adobe oven that looks like an overgrown beehive. Most of the recipes first appeared in the *New Mexico Magazine*, and the book is published by UNM Press. Covered are breads, salads and vegetables, main dishes, desserts, pies, cakes and cookies, and candies. It's \$6.95, and you can examine and get a copy at the LAB NEWS office, Bldg. 814. •js

\* \* \*

### Congratulations

JoAnn (5343) and James Smith, a daughter, Lauren Anne, June 16.

Steve Wright (6423) and Susan Weeks, a son, Paul, June 16.

Steve (2857) and Yvonne Arroyo, a son, Aaron Michael, June 9.

Rod (2858) and Donna Forsythe, twins, a son, Torey Jacob, and a daughter, Taryn Jenea, June 13.

Johnnie (5313) and Lisa Griego, a son, Johnnie Lee, June 20.

Robert McCornack (2626) and Marjorie Turner (5329), married in Terre Haute, Ind., on June 1.

The New Mexico Jazz Workshop announces the following Sunday Jazz concerts at Madrid: July 14 — Variety with Talisman, Jazz Alliance, Steel Jazz, and others; Aug. 4 — Blues Day with Charlie Summons Blues Band, Broad Street, the Wickham Bros., and more; Aug. 19 — Bebop & More with Melodious Thump, Hooks with Bruce Dunlap, Delta, featuring Santa Fe pianist Kevin Zoernig, Arlen Asher, and others.

All concerts are held in the ballpark at Madrid, Highway 14 between Albuquerque and Santa Fe, at 3 p.m. Admission is \$5. If you are interested in volunteer work at these concerts, call Charlotte Smith at 293-4852.

\* \* \*

KAFB's Que Pasa Recreation Center hosts a Lunchtime Concert each Wednesday from 11 to 12:30 at the East Parade Ground. The concerts are free; bring your own lunch or purchase food and beverage from the mobile snack trailer. The concert series will continue through the last Wednesday in August. Entertainment includes the New Mexico Fiddlers, Mariachi Nuevo Tapatio, Talisman, and next week, July 10, come out and enjoy the Maxwell AFB Air University Band, MAXLOAD. For more information call the Center at 844-5420.

\* \* \*

The "International Conference on the Physics and Chemistry of Boron and Boron-Rich Borides" will be held July 29-31 at UNM. Sandians David Emin (1151) and George Samara (1130) are members of the organizing committee for the conference. Topics include "Structure and Phase Transitions," "Bonding and Electronic Structure," "Magnetic Properties," "Electronic and Thermal Transport," and others. For information about the conference, talk to Terrence Aselage (1846) at 4-0949.

\* \* \*

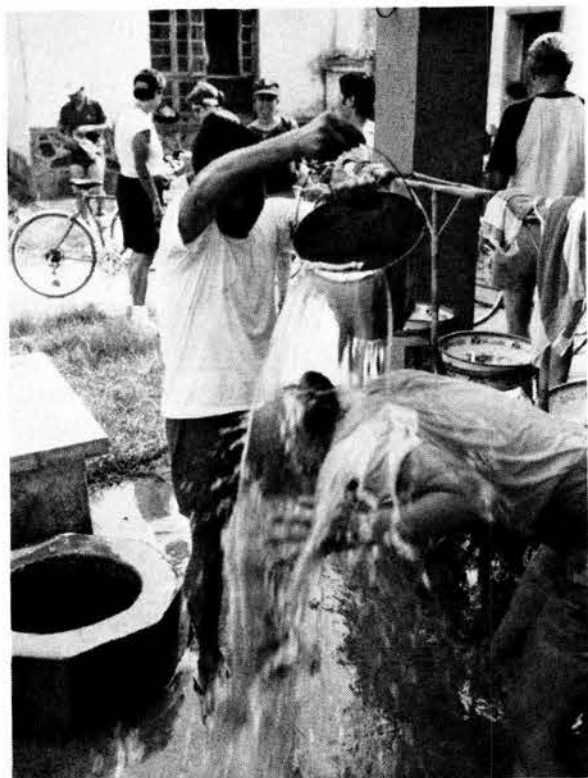
David Gartling (1511) is a member of the faculty for a seminar on "Finite Element Methods in Fluid Mechanics," to be held September 9-13 at the University of Minnesota in St. Paul. Seminar participants will be introduced to the finite element method as a computational tool for solving problems in fluid mechanics and heat engineering. The seminar awards participants three Continuing Education Units. For more information, call the Program Director, John Vollum, at (612) 373-3157.

\* \* \*

Two bucks for all the ice cream, sundaes, and floats you can eat. That's one attraction of "The Only Borden Poco Loco Eat-Em-Up Lobos Raise the Roof Ice Cream Feast" from 1 to 5 p.m. on July 14 at the UNM Football Stadium. The other attraction is that all the money raised — the goal is \$30,000 — will be donated to UNM's John Baker Memorial Field House Fund, specifically to the construction of a warm-up lounge. Sponsored by Borden Dairy (which will donate 5000 gallons of ice cream), the event also includes bands, contests, and prizes.



# Not All the Tea in China — But a Dream Come True



**CURIOSLY REFRESHING** — Rest stops with cool water were provided for the cyclists at regular intervals. In an effort to combat the intense heat, Karen Higgins (1823) has her guide simply drench her.

Ever since she was a child, Karen Higgins (1823) has been what she calls a "China-phile." She was nearly heartbroken when, sometime in grade school, she learned that China had been closed by the Communist regime.

Karen is also an avid bicyclist. She rides to work when she can and often takes weekend bicycling trips. Last summer a dream came true when she took a bicycling tour of the now re-opened Republic of China.

The 23-day tour took her from Beijing (Peking) to Shanghai, along the Yangtze River Valley through China's "rice bowl," with visits to some ancient cities not normally accessible to the ordinary tourist. True, the entire trip was not by bicycle; the group flew to some cities and also traveled by bus and train.

"We had a pick-up bus with drinks and our luggage," Karen explains, "but all they had for us to drink were beer and orange soda — both seem to be national drinks — and what we wanted most was water. It took us a while to get them educated."

The tour company provided an American tour leader who had made the trip before. This leader acted as liaison with the Chinese national tour guide who accompanied them throughout the tour. "We also had a local person for each province who spoke English and acted as a guide for that particular area," Karen says.

"Because we were considered athletes, rather than simply tourists, we were under the auspices of the All-China Sports Federation rather than the tourist bureau," she continues. "That gave us a great deal more freedom."

That freedom as a bicyclist was Karen's favorite aspect of the trip. "We saw incredible things that ordinary tourists on their air-conditioned buses never get to see," she says. "They don't get a chance to interact with the people the way we did."

"When we'd stop to wait for some of the

others to catch up, we'd draw a crowd of 20 or 30 really curious people," she continues. "They were particularly interested in our bicycles, which were Chinese 10-speeds. All of us, except the guide, rented them for about \$50 for the whole tour."

"They'd never seen a 10-speed before. The Chinese manufacture only enough for their sports people. Ordinary Chinese wouldn't have any use for a 10-speed because they need heavier, sturdier bicycles. They are like a family car. You might see a man riding a bicycle with his wife sitting sidesaddle on the back holding the baby or the umbrella.

"And they're working vehicles," Karen continues. "They carry cages and cages of chickens or ducks or sheep. They even move large pieces of furniture, like a couch, on them."

"Local folks couldn't understand why anyone would take a vacation to ride a bicycle when they have to ride bikes every day.

"Most tourists are taken only to Friendship Shops, where they can buy tourist-type items made solely for export," Karen continues. She did her shopping in department



A COMBINATION stroller-playpen is the usual mode of transportation for Chinese toddlers.

stores and neighborhood shops.

"I knew what I wanted before I left for China," Karen says. "In a sense, I'd been preparing for this trip for nearly all my life." She even took along an empty suitcase so she could carry home her treasures such as rugs, carved jade, and pottery.

Having a long-time interest in archeology, Karen was particularly interested in the pottery made by an ethnic minority in Banpo, just outside Xi'an. "The designs look just like Mimbres pottery here in New Mexico," she says.

Karen remembers the heat. "It was like being in Mississippi during the summer — very hot and humid," she says. "I never sweated so much in my life. You just learned that you weren't going to look decent and that you were going to sweat a lot."

The group stayed in good-quality hotels and ate good food — except breakfasts, which were Western style: eggs, toast, and coffee. "The eggs were really terrible," Karen says. But she had taken along a jar of salsa, which made them more palatable.

"We had six or seven banquets during the tour," she continues. "To the Chinese, presentation of food is as important as its taste. For example, we had melon soup served in a melon with butterflies carved on the outside of the shell."

When the group arrived at one hotel, Karen says she had an experience she'll never have again. "We rode into the hotel courtyard about 6:20 p.m.," she says. "The entire staff of the hotel were lined up as if the lord and lady of the manor were coming



**INTERRUPTED LUNCH** — A young Chinese student gazes wistfully at his teacher, hoping he can soon get back to his lunch, which was interrupted by the arrival of the cyclists for an official visit.

home, and they applauded as we rode over the ramp. I felt like royalty."

Visiting factories, on the other hand, became something of a chore. "It seemed as if we toured every factory in every province we visited," she says. "All work is done by hand. There's very little mechanization — and there's even less regard for safety. I saw welders with no eye protection and painters working in a room with no ventilation.

"I'm really glad I went when I did," she continues. "Things are changing so rapidly. China isn't like the eastern bloc countries. The Chinese are apparently breaking away from Communism and going back somewhat to their traditional culture. They're not westernizing either, even though they're moving more toward free enterprise. After all, they've been bargaining and haggling for thousands of years."

"I wouldn't have missed this trip for all the tea in China," Karen says. And she wants to return. "Definitely, one way or the other I'm going back," she says.

**Logistics:** Karen booked her trip with China Passage, 302 Fifth Av., New York, New York 10001 (202-564-4009). Cost for the package was approximately \$3000, exclusive of air fare to San Francisco.

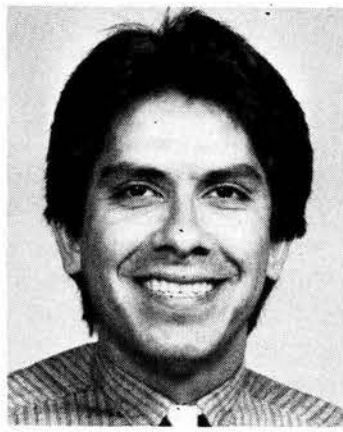


**CHINESE BICYCLES** are not pleasure vehicles. They're working vehicles. This man uses his bicycle to transport a couch.

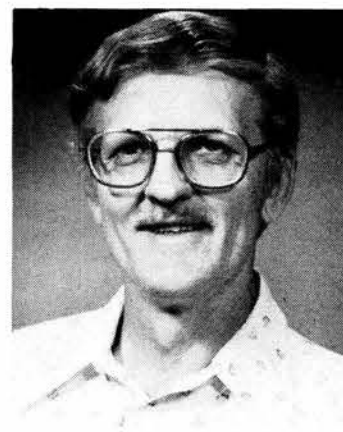
# MILEPOSTS

## LAB NEWS

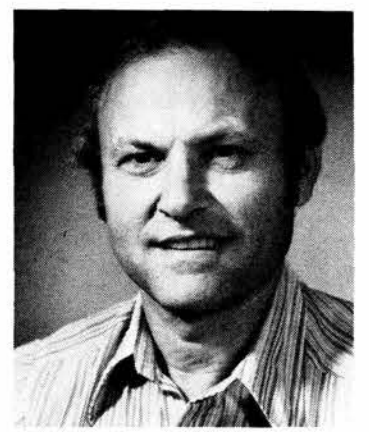
JULY 1985



Jim Alvarez (8176) 10



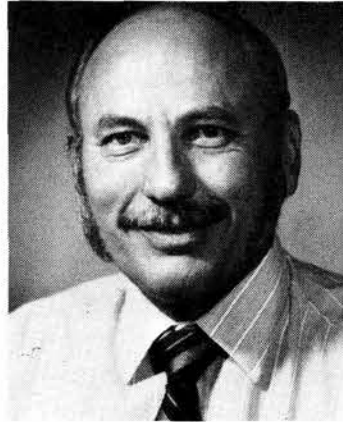
Arlo Nord (7544) 25



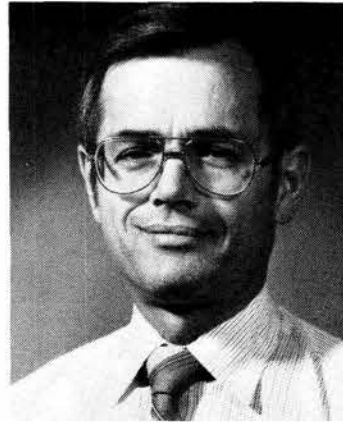
John Brane (2832) 25



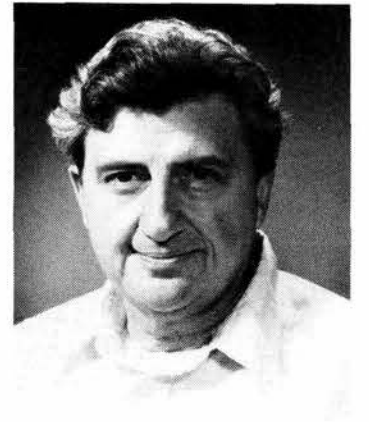
Leo Klamerus (2567) 25



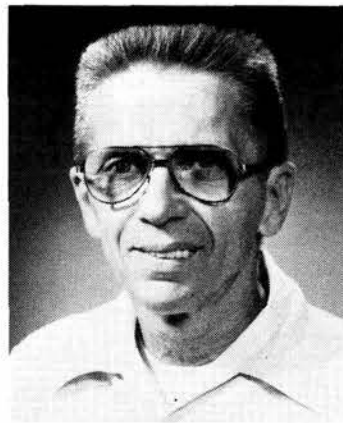
Jim McDowell (5127) 25



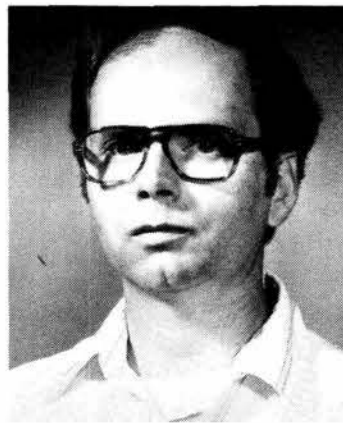
Don Schroeder (5164) 20



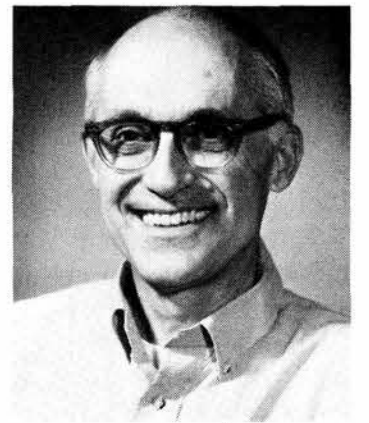
Tony Russo (1512) 25



Gene Cnare (1221) 30



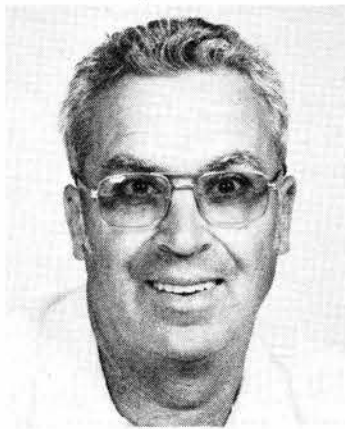
Gary Phipps (7556) 15



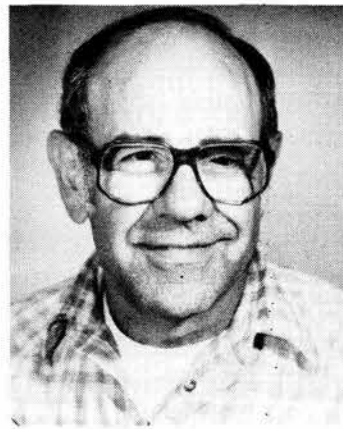
Doug Browne (7121) 25



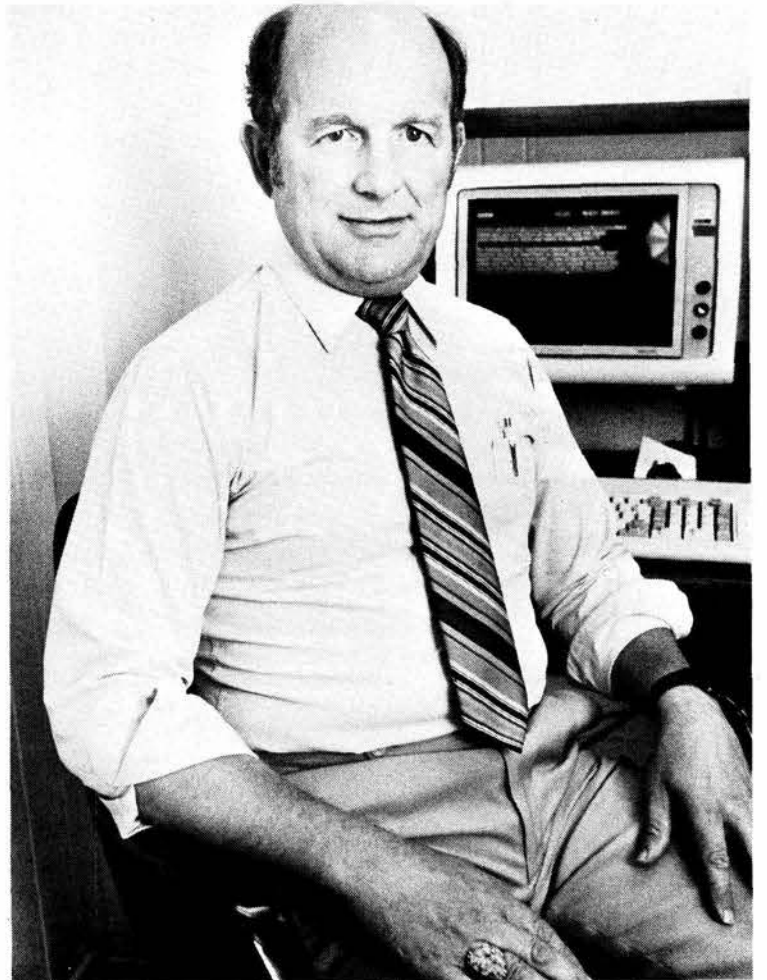
Curt Franklin (8163) 25



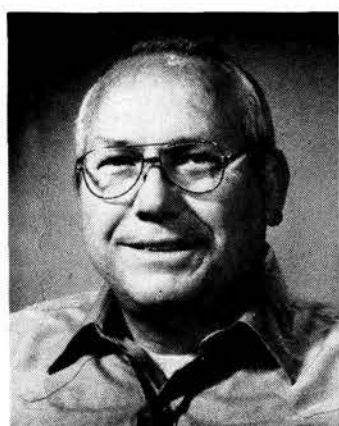
Clarence Rogers (8257) 25



Dave Sample (6313) 30



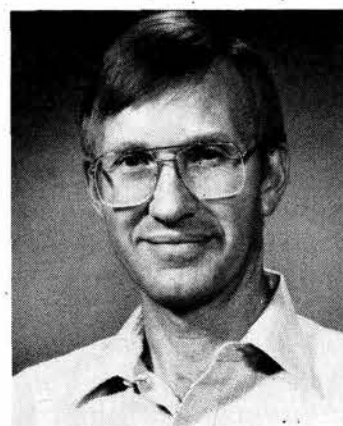
Dave Bray (5145) 25



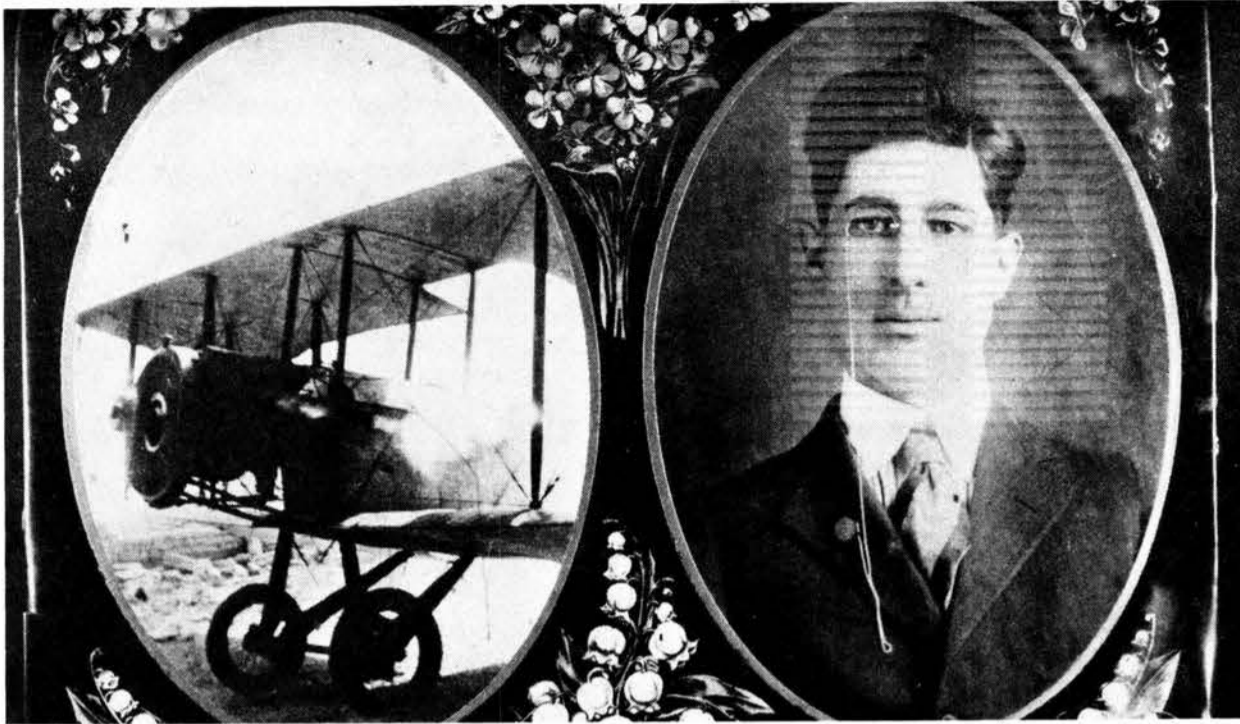
Leroy Gibson (7482) 30



Dick Sons (5261) 20



Al Giddings (2115) 25



## Favorite Old Photo

These two photos in a dual frame show my uncle Alfred Nuanes and the biplane that he built himself in 1922. He received a patent for the propeller design. He also worked for the railroad and was a dashing young man — notice the pince-nez. He crashed the airplane before I was born, but he was something of a family hero. He married a rich lady and moved to California. He died there about 10 years ago at the age of 70. — Lil Silva (Ret.)

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2. Include organization and full name with each ad submission.
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4. Use 8½ by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per issue per category.
8. No more than two insertions of same ad.
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10. No commercial ads.
11. For active and retired Sandians and DOE employees only.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

### MISCELLANEOUS

- CABOVER camper, 8½', for ¾-ton truck, stove, oven, refrig., toilet, furnace, jacks, \$1100 OBO. Shea, 897-1683.
- LEVI canvas top for Jeep CJ5, new, \$150; Kodak Tri-X reversal film 7278, Super 8, 50' 16 rolls, \$50. Naylor, 262-0382.
- '83 KOMFORT 40' travel trailer, tip-out, dual A/C, W/D hook-up, storm windows, Levelor blinds, rollout awning. Daut, 255-2529.
- CORDLESS wall clock, 2 sconces, \$15; TV stand, 24"L, 15"W, decorative legs, \$25; warming tray, \$10; appliance roller wheels, 2 for \$8. Smith, 299-7151.
- WARDS sewing machine, desk model, \$75; mandolin, cost \$260, sell \$100. Cole, 298-4527.
- ELECTRONIC organ, 2 keyboards w/foot pedals, \$300 OBO. Gross, 294-2655.
- INSULATION kit, water heater, round, gas or elec., up to 80 gallons, never unpacked, new \$25, sell \$20. Schkade, 292-5126.
- CAMPER shell, short, narrow bed, \$200; bedroom set, girl's, white, twin canopy bed w/mattress & box springs, dbl. dresser/mirror, night stand & bookcase, \$285. Smith, 299-5030.
- WEDDING dress, slip, size 10, \$400 new, sell \$200; veil, \$100 new, sell \$50. Semarge, 298-2352.
- SOFA, 6', lt. blue w/white & beige, used 6 mos., \$500 new, \$200 OBO. Loubriel, 344-5340.
- VIOLINS: full size Lewis & ¾ size Glaesel, \$325 each. Jaramillo, 831-6415.
- FREE puppy, 7-wk.-old female Shepherd mix needs good home. Etter, 294-9604.

- TWO Broyhill sofas, floral print, \$200 each; walnut dining table, 6 chairs, \$200; twin mattress, spring, frame, \$75. Esterly, 296-9759.
- 25 2' railroad ties, \$1.50 each. Hartwig, 298-5048.
- CALCULATOR, TI Business Analyst model, portable w/AC adaptor, case & owner's manual, \$25. Barr, 821-5870.
- SHOP manuals, 6 vols. for '73 Ford cars. Roberts, 255-9527.
- KENMORE gas dryer, lg. capacity, mate to 80 series Kenmore washer, 7 mos. old, still under warranty, \$325. Pilcher, 299-2850.
- SINGER sewing machine in wood cabinet, make offer. Padilla, 831-0330 after 5:30.
- EXERCISE bike w/speedometer, \$50. Chorley, 296-1454.
- CARPET piece, 78"x78", rust color, 100% nylon pile, \$20. Rowe, 881-6159.
- TRUCK bumper from '75 Chevy short bed, \$10. Martinez, 296-2762.
- SOFA, brown, cream, peach print, 8 lg. pillows, floral print, valance on bottom, \$200. Stewart, 298-4955.
- FREEZER, Frigidaire, upright, 12.3 cu. ft., \$75. Odinek, 892-5822.
- SPEED QUEEN washer & dryer, stainless steel drums, \$200 pr.; GE port. dishwasher, \$75; port. window AC, \$50. Blackledge, 294-6030.
- GREAT DANE, lg. black guard dog, 2 yrs. old, \$100; lg. dog house included. Brunon, 296-3277.
- BARBEQUE grill, \$15; new 3.0x3.0 dbl. pane window w/screen, \$60; wrought iron lamp, candleholders, misc. items all \$20. Shaw, 299-8524.
- BABY items: stroller, high chair, car seat; new solar cover material, 22"x30", 14"x30", \$10 ea. Strascina, 294-0305.
- SWIMMING pool, above ground, 16'x30', oval, take in exchange for paving the area. Cosden, 881-1412.
- BLACK male sheep dog, free to good home, 3 yrs. old, 20 lbs.; Carabello Italian moped, \$150. Moss, 888-4386.
- POWER lawn mower, reel type, \$30. Navratil, 293-5527.
- 3 GOODYEAR Wrangler radials, 22K miles, P235/75R15, \$25 each. Benton, 877-2473.
- COUNTRY French pastel blue sofa; cocktail tables, best offer. Turpin, 299-7580.
- KENMORE 16 cu. ft. freezer (upright), less than 4 yrs. old; Lazy Boy recliner, 2 yrs. old. Harris, 892-6281.
- DISHWASHER, Sears, butcher block top, \$75 OBO. Barton, 268-7349.
- NORGE gas dryer, large capacity, \$100 OBO. Sandoval, 291-9004.
- FREE landscape rock, small red lava rock, medium sized gravel, you haul, will help w/loading. Wilcoxon, 296-8295.
- BACK chair for computing and sewing, wooden, upholstered, \$40 OBO. Montague, 255-2670.
- 4 NEW '85 Toyota tires w/rims, fits Chevy, 6 lugs, \$300 OBO. Griffin, 298-9481.

- RANCH oak furniture, 6 piece set - couch, coffee table, 2 chairs, 2 end tables, best offer. Pendleton, 299-7138.
- STEREO equipment, Sony, reel-to-reel, TC-250-A, \$70; G.E. portable record player, \$25; AKAI, 8-track, AM/FM w/speakers, \$75. Robb, 821-2999.
- BEDROOM set, includes box springs & mattress (double bed), bookcase headboard, bureau, mirror & two end tables, \$100. Purcell, 296-4986.
- HOOVER upright vacuum cleaner w/hose & cleaning attachments, \$40 OBO. Patteson, 822-1722.
- NAVA motorcycle helmet, black, rarely used, retails for over \$100, sell for \$50. Montano, 881-4669.
- TRAILER hitch, heavy duty, 2" ball, for larger Ford-Mercury vehicles, \$125; pegboard hooks, various sizes, 25 cents each. Hall, 299-0009.
- CAMPER shell, fits long-wide-bed, Admiral, \$175. Sargent, 299-8170.
- SOFA w/matching Barcalounger rocker/recliner, natural color, \$250; vinyl camel color rocker/recliner, \$100; Sears elec. adding machine, \$25. Bernyk, 898-9045.
- SOFA; love seat; coffee & end tables; dbl. bed; Panasonic stereo; albums. Clement, 299-1501.

### TRANSPORTATION

- FUJI 12-spd bicycle, 25" frame, alloy hubs, rims, crank, handlebars, \$175. Thompson, 293-8390.
- '79 TOYOTA Corolla Deluxe stn. wgn. low mileage, new radials, wire wheels, new paint, AC, \$3600; '71 VW bus, new trans., radials, new clutch & battery, \$1100. Frye, 255-8364.
- '83 PONTIAC 2000, 17K miles, gray, PS, PB, AC, tilt seat & wheels, FM stereo, automatic, \$6000. Mortley, 293-3638.
- '82 SUZUKI GS650E, bought new in spring '85, 1600 miles, \$1400 or trade. Smith, 883-4751.
- '81 PLYMOUTH Reliant K-car, 58K miles, AC, AT, AM/FM, 4-door sedan, seats 6, one owner, \$3600. Van Berkel, 897-2541.
- '66 IMPALA, 5K miles on rebuilt engine/transmission, interior needs work, \$600. Davis, 298-3277.
- '62 DODGE Lancer, slant 6, 3-speed, manual, 2-door, model 170. Anderson, 242-2513.
- '59 CHEVY ¾ ton pickup, \$650 OMO. Baca, 294-2387 or 293-4843.
- '78 SUZUKI GS 750E, 12K miles, always covered, \$1000. Brown, 344-9854.
- '79 MERCURY Monarch Sport Coupe, 250 6-cyl., 3-speed, man. stick w/OD, AC, AM/FM stereo, one owner, 60K miles, \$2000 OBO. Hallett, 892-6543.
- '80 LUV pickup, low miles, AC, new brakes, custom shell, AM/FM cassette. Foster, after 6, 299-6240.
- '77 F-150 4-wd pickup, PS, PB, big tires, rebuilt engine, \$3300. Klocinski, 242-8418.

- '77 MONTE CARLO V8, AT, sun roof, landau top, AC, AM/FM, worn fabric, 64K miles, \$1500. Hartwig, 298-5048.
- '78 OLDS Cutlass wagon, 260 V8, auto, PS, PB, AC, \$2600. Smith, 296-1908.
- '74 FORD Galaxy 500, AT, AC, PS, PB, \$700. Julius, 299-1105.
- '73 240Z, \$2500. Fenimore, 298-8052.
- '84 FORD XLT Ranger PU, 4-spd, diesel, insulated shell, 20K miles, \$6000 OBO. Class, 281-3836.
- '74 YAMAHA 360 Enduro, \$600 OBO. Garcia, after 5, 268-3848.
- '77 MGB Convertible, \$3000. Lovato, 298-1576.
- '73 VOLVO 2-door, one owner, red, \$1000. Etter, 294-9604.
- '81 KAWASAKI KZ550LTD, plexi-fairing, cruise control, case-savers, oil cooler, Kerker header, new chain & sprockets, 12K miles, \$1K. Gonzales, 294-2060.
- '80 PEUGEOT 504 SW diesel, AC, PS, PB, AM/FM cassette, tinted windows, 58K miles, 30 mpg, \$5100. Thompson, 293-8390.
- '74 FORD Grand Torino stn. wgn., low mileage, PB, PS, AC, cruise control, reg. gas, \$1295. Reese, 299-0866.
- '75 AUDI FOX, 4-spd, AM/FM, 25 mpg in town, \$650 OBO. Rodeman, 821-8623.
- '82 YAMAHA 650 Maxim, shaft drive, under 3K miles, 2 helmets, winter & summer gloves, \$1600 cash. Nevarez, 243-2597.
- '78 YAMAHA YZ250 dirt bike, complete with helmet, visor, manual & spare parts, \$650. Caldwell, 294-6796.
- '81 DATSUN truck, diesel, 5-spd, AC, camper shell, \$4500 OBO. Blair, 294-0824.
- SAILBOAT Sunfish, 14' w/trailer complete, \$800 OBO. Shea, 897-1683.
- CENTURION Omega 10-speed bike, 49 cm. frame, 26" wheels, fully serviced, \$98 firm. Gauster, 822-8973.
- 10-SPEED bicycle, 21" frame, \$45. McKiernan, 255-2277.
- '85 YAMAHA TRI-Z 250 3-wheeler, many extras, \$1850 OBO. Hurley, 296-9264.
- '77 CHEV. Malibu Classic, PS, PB, AC, 4-dr., V8, NADA \$2000. Stephenson, 836-4260.
- '73 DODGE 4x4 360 V8, AT, PS, PB, AC, new tires, low miles, w/shell. Randall, 821-0388.

### REAL ESTATE

- ADULT Park Meadows, Bendix double wide, 24x64, large den, custom built, 2-bdrms, 1½ baths, walk in closets, all appliances, storm windows, mobile upgraded, 1450 sq. ft., sp#67. Mueller, 821-6391.
- TOWN HOUSE, Chimney Ridge, 6020 del Campo, N.E., 2-bdrm, 2-bath, fireplace, garage, atrium, club house, swimming pool, tennis. \$75K. Frye, 255-8364.

- BEAR CANYON, 2700 sq. ft., 4-bdrm + study, tile, carpeting, sprinklers, arbor, alarm system, assumable 9.75%, \$152K. Furman, 822-0373.
- 3-BDRM on ½ acre, landscaped, w/sprinklers, low down, assumable financing, horses permitted, \$53K. Lucero, 873-2919.
- FOOTHILLS home, 3-bdrms, 1¼ baths, one year old. Gallegos, 293-2408.
- 20 ACRES mountain property south of Frost Rd., east of Hwy 217, pinon, adjoins subdivision. \$95K. Montague, 255-2670.
- 9 ACRES w/telephone & electricity, near Estancia, bounded by roads on 3-sides, \$15K at 10% interest & 10% down payment. Thomas, 256-1921.
- 2 ACRES, south of Bosque Farms, power to property, neat sparsely settled area, mountain views, \$25K. Grant, 865-0785.

### WANTED

- COMPOUND hunting bow, 32" or 33", draw length. Smith, 883-4751.
- CAR COVER for 2-door Camaro. Hitchcock, 294-4591.
- TELESCOPE mirror, 8" or 10" diameter with or without telescope body. Hansche, 281-5623.
- USED tool box to fit 1984 Nissan pickup. Serrano, 293-1066.
- MATTEL Intellivision master component. Jewell, after 6, 892-6373.
- FEMALE roommate to share new fully furnished condo, own master suite with full bath, \$250/mo. + ½ utilities Garcia, 255-2337.
- HOUSEMATE to share furnished solar home in N.E. Heights, private bath, full house privileges, non-smoker, should like pets. Siegel, 822-8329.
- POWER lawn mower in good condition. Tomek-Martinez, 292-3041.

### WORK WANTED

- TILLING, \$12/hr., clearing, hauling, landscaping, mowing, yard & tree maintenance, pool service, more references, photographs. Magnuson, 821-5330.
- HIGH school senior seeks apprenticeship level employment in photography, have transportation & some equipment. Brunon, 296-3277.
- UNIVERSITY student non-smoker male will house sit heights & near mountain area, loves animals, references. Luhrs, 281-2595.
- LANDSCAPING — sod, gravel, RR ties, etc.; mowing, hauling; free estimates. Paul Holt, 294-6928 after 7/7/85.

### LOST AND FOUND

- LOST RAYBAN (pilots) sunglasses during week of June 10th. Reward! King, 298-2628.
- LOST TIMEX wrist watch, band has three turquoise stones on each side, lost leaving Credit Union headed for Gate 1. Griffin, 294-5702.

## Poor Boys Tonight, Luau Tomorrow

TONIGHT the Isleta Poor Boys return to the Coronado Club bandstand to play their popular brand of country and western music for dancing. The dining room features a couple of two-for-one specials — prime rib or scallops, two dinners for \$12.95. Free country western dance lessons are offered from 7:30 to 8:30. It's not too late for reservations — call 265-6791 right now.

THE ANNUAL LUAU that turns the Club's pool and patio area into a tropical paradise while members break out their wild Field Test sport shirts and grass skirts is set tomorrow starting at 5 p.m. Enjoy a mai tai and watch Chef Henry roast a whole porker in the patio fireplace. Dinner will be a fantastic spread of roast pig, halibut, sweet and sour chicken, teriyaki beef, assorted Polynesian and oriental vegetables, and tropical fruit salads. The Pearls of the Pacific entertainment troupe of hula dancers, flame dancers, comics, and musicians will perform. Tickets are \$12.95. Again, it's not too late for reservations — call 265-6791.

THE THUNDERBIRDS retiree group holds a dinner dance on the patio on Wednesday, July 10. Bob Banks and the Trio play for dancing. Dinner is your choice of barbecued chicken or beef at \$5.25. Reservations are required — the magic number is 265-6791.

ON FRIDAY, July 12, the dining room features another two-for-one menu, either

filet mignon or fried shrimp, two dinners for \$12.95. Southside plays for dancing.

TWO TRAVEL PROGRAMS are coming up on the calendar. Mark Monday, July 15, for a slide show tour of the north shore of Lake Superior and the boundary waters of Canada. Bob Butler (7233) will describe his trip of last October, a preview of the Club-sponsored tour scheduled Oct. 4-13. Cost is \$690, double occupancy.

On Monday, July 22, Ed (2361) and Lu Neidel will present a slide show of their trip to Scandinavia (LAB NEWS, May 10, 1985). Both travel programs start at 7:30 p.m. in the ballroom. There is no admission charge.

The Club office has information on upcoming Club-sponsored trips: Gallup Indian Ceremonial, Aug. 10, \$35; Hawaii, Sept. 14-20, \$510; Cumbres-Toltec (all the way across), Sept. 28, \$45 adults, \$33 children under 12; Canyon de Chelly, Oct. 26-27, \$90; and Havasu City/Laughlin by bus Oct. 12-15, \$160.

A TEEN DANCE is scheduled in the pool/patio area on Wednesday, July 17, starting at 7:30 p.m. Dunn's Dancing Machine provides the music. The snack bar will be open featuring a free soft drink with the purchase of a hamburger.

SINGLES gather on Thursday, July 25, in the ballroom starting at 5 p.m. Music for dancing will be made by Dunn's Dancing Machine. Margaritas and beer go for 50 cents. You go and mingle.

## Events Calendar

- July 5-7 — Fiesta Days: Mexican Fiesta in the Coronado Center Mall — mariachi band, food booths; Fri. 10-9, Sat. 10-6, Sun. 12-6; 881-2700.
- July 6 — Three Spirituals and Bach's 300th Birthday by the Desert Chorale; 8 p.m., Keller Hall, UNM, 277-4402.
- July 6 — Deutsches Summerfest: 5-10 p.m., Civic Plaza.
- July 7 — Southwest Pickers Bluegrass, 2 p.m. at the ballpark in Madrid.
- July 10-12 — Air Force Bands, Max Wellaires with Big Band Jazz, 1-2 p.m., Old Town Plaza.
- July 12 — Summerfest: KRZY Country Friday Nite on the Plaza with "Lawyers, Guns & Money," 5:30-8:30 p.m., Civic Plaza.
- July 12-13 — British American Theatre Institute, American premiere of "Taylor's Tickler," 8 p.m., Albuquerque Little Theatre, 242-4750.
- July 13 — Summerfest: La Bal du Quar-torze, the French equivalent of our July 4th celebration, 5-11 p.m., Civic Plaza.
- July 13-14 — O.P.E.R.A. presents "Oklahoma and Three Operas," 8:15 p.m., Heights Community Center, 823 Buena Vista SE, 266-7895.
- July 14-Aug. 18 — 35th Annual Summer Raymond Jonson Exhibition. From the reserve collection of approximately 700 works by Jonson. Tues.-Fri. 10 a.m.-4 p.m. Call 277-4967 for evening and weekend hours. Jonson Gallery, 1909 Los Lomas, NE, UNM.
- July 15 — Lecture Under the Stars: Douglas Schwartz, President, School of American Research, Santa Fe, "From Confucius to Communism: The Cycle of Chinese Civilization," 8 p.m., NM Union Ballroom, UNM.



SCHOLARSHIP SUPPORT AWARD — Roberta Ingram (7251) presents a plaque to President Dacey in recognition of Sandia's support of the scholarship activities of the National Technical Association and the National Association of Black Accountants. Shirley Wallace (155) looks on. At a recent banquet, NTA and NABA awarded certificates of recognition and awards totaling \$1500 to students from sixth grade through college. Roberta is president of NTA; Shirley was chairperson of the awards banquet.

## 937 Best Sellers

The U.S. Government Printing Office has put together a new catalog of the Government's bestselling books. Books like *The Space Shuttle at Work*, *Cutting Energy Costs*, *Infant Care*, *National Park Guide and Map*, *Federal Benefits for Veterans and Dependents*, *The Back-Yard Mechanic*, *Merchandising Your Job Talents*, and *Starting a Business*. Find out what Government books are all about. Send for your free catalog.

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